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FEDERAL - STATE - PRIVATE
COOPERATIVE
**SNOW SURVEY and WATER SUPPLY FORECASTS
for
COLORADO and NEW MEXICO**

UNITED STATES DEPARTMENT of AGRICULTURE--SOIL CONSERVATION SERVICE
and
COLORADO AGRICULTURAL EXPERIMENT STATION,
STATE ENGINEER of COLORADO
and STATE ENGINEER of NEW MEXICO

Data included in this report were obtained by the agencies
named above in cooperation with the Bureau of Reclamation,
U.S. Forest Service, National Park Service and other Federal,
State, and private organizations.

AS OF
APR. 1, 1960

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an impounding water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
COLORADO AND STATE OF UTAH	MONTHLY (JAN.-MAY)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER AND OTHER AGENCIES
COLUMBIA AND STATES OF IDAHO AND ALASKA	MONTHLY (JAN.-MAY)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
UPPER MISSOURI AND STATE OF MONTANA	MONTHLY (FEB.-MAY)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
WEST-WIDE	OCT. 1, APR. 1, MAY 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ARIZONA	SEMI-MONTHLY (JAN. 15 - APR. 1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOCIATION ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. AGR. EXP. STATION COLO. STATE ENGINEER N. MEX. STATE ENGINEER
NEVADA	MONTHLY (FEB.-APR.)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-MAY)	PORTLAND, OREGON	ORE. AGR. EXP. STATION OREGON STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-MAY)	SPOKANE, WASHINGTON	WASH. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

Copies of these various reports may be secured from: Head, Water Supply Forecasting Section
Soil Conservation Service
209 S. W. Fifth Ave., Portland 4, Oregon

<u>REPORT</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	COMPTROLLER, WATER RIGHTS BR., DEPT. OF LANDS AND FORESTS, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIFORNIA DEPT. OF WATER RESOURCES, SACRAMENTO, CALIFORNIA

FEDERAL-STATE COOPERATIVE
SNOW SURVEYS AND WATER SUPPLY FORECASTS
for

COLORADO RIVER, PLATTE RIVER
ARKANSAS RIVER AND RIO GRANDE
DRAINAGE BASINS

Issued

April 1, 1960

Report Prepared By
Jack N. Washichek, Snow Survey Supervisor
and
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Fort Collins, Colorado

United States Department of Agriculture
Soil Conservation Service
and
Colorado Agricultural Experiment Station
Fort Collins, Colorado
and
State Engineer of Colorado
Denver, Colorado
and
State Engineer of New Mexico
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Issued By

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Experiment Station

S. E. Reynolds
State Engineer
State of New Mexico

WATER SUPPLY OUTLOOK
COLORADO, RIO GRANDE, PLATTE AND ARKANSAS
DRAINAGE BASINS
APRIL 1, 1960

WATER SUPPLY OUTLOOK FOR APRIL 1, 1960, RANGES FROM 85% OF NORMAL IN NORTHERN COLORADO TO 150% ON THE RIO GRANDE IN NEW MEXICO. THE SNOWPACK INCREASED IN MOST AREAS ABOUT NORMALLY. THE EXCEPTION WAS AREAS ON THE RIO GRANDE THAT SHOWED LOSS OF LOW ELEVATION SNOWS. HIGH UNSEASONABLE TEMPERATURES THROUGHOUT THE STATE AND UPPER NEW MEXICO HAVE MELTED LOW SNOWS AND STREAMS ARE ALREADY RISING. THE SAN JUAN HAS MUCH ABOVE NORMAL FLOW ALREADY. THERE SHOULD BE NO SEVERE SHORTAGES IN THE TWO STATES THIS SUMMER.

COLORADO. The Northern half of the state still has the lowest snowpack. The Clear Creek and Upper South Platte showed the greatest improvement. High elevation snowpacks are good in most areas but the low snow fields are deficient. The southern half of the state should have an adequate water supply for irrigation needs this summer except for the Lower Arkansas. Some shortages could be experienced in this area. John Martin Reservoir contains only about one-tenth of the water it had last year. The areas east of the foothills had considerable snow in the flat land this year which left the soil moisture conditions above normal. Mountain soils are also well above normal. This could help reduce shortages.

NEW MEXICO. Water supply outlook for the area served by snowmelt runoff looks excellent at this time. The low snows did not show a normal increase during the month of March, but this could be due to melting. Several days of high temperatures near the end of March started small streams running. Snowpack in Colorado on the main stem of the Rio Grande is excellent and this trend generally continues on into New Mexico.

Storage on the Tucumcari Project is above normal, while storage in Elephant Butte and Caballo is below average.

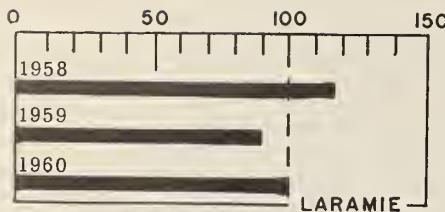
WATER SUPPLY OUTLOOK

THE MAP ON THIS PAGE INDICATES THE MOST PROBABLE WATER SUPPLY AS OF THE DATE OF THIS REPORT. ESTIMATES ASSUME AVERAGE CONDITIONS OF SNOW FALL, PRECIPITATION AND OTHER FACTORS FROM THIS DATE TO THE END OF THE FORECAST PERIOD. AS THE SEASON PROGRESSES ACCURACY OF ESTIMATES IMPROVE. IN ADDITION TO EXPECTED STREAM-FLOW, RESERVOIR STORAGE, SOIL MOISTURE IN IRRIGATED AREAS, AND OTHER FACTORS ARE CONSIDERED IN ESTIMATING WATER SUPPLY. ESTIMATES APPLY TO IRRIGATED AREAS ALONG THE MAIN STREAMS AND MAY NOT INDICATE CONDITIONS ON SMALL TRIBUTARIES.

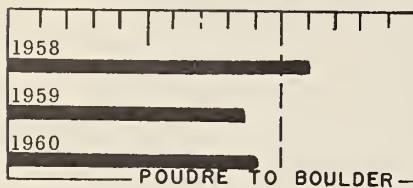
April 1, 1960



WATER SUPPLY OUTLOOK



THE BAR CHARTS ON THIS AND THE NEXT PAGE REPRESENT GRAPHICALLY THE MOST PROBABLE WATER SUPPLY OUTLOOK FOR 1960 AS COMPARED TO 1958 AND 1959. STREAMFLOW AND OTHER FACTORS FOR 1959 ARE PARTIALLY ESTIMATED AS FULL DATA ON WATER SUPPLY CONDITIONS ARE NOT YET AVAILABLE. ESTIMATES OF PAST CONDITIONS AND FORECASTS HAVE BEEN MADE BY THE AUTHORS OF THIS REPORT IN CONSULTATION WITH WATER OFFICIALS.



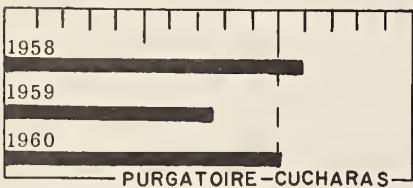
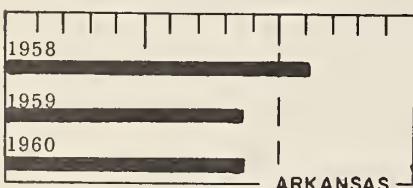
LARAMIE: Snowpack on the Laramie River Watershed increased just about normally during March. The high elevation snowpack is good, but diminishes at lower elevations. The forecast is for 70% of normal, however, this should supply irrigated lands in Colorado with a nearly adequate water supply. Soil moisture is reported as good at all elevations.

POUDRE TO BOULDER: This area will experience some shortages of water, but they should not be severe. Snowpack ranges from 65% of normal on the St. Vrain to 94% on the Poudre. The average for all streams in this area is about 90%. The St. Vrain has been the consistently low snow area. Soil moisture is considered good in most areas. Warm weather experienced during the latter part of March started streams flowing. The Colorado-Big Thompson Project now contains slightly over 400,000 acre feet of supplemental water. Smaller irrigation reservoirs are above normal.

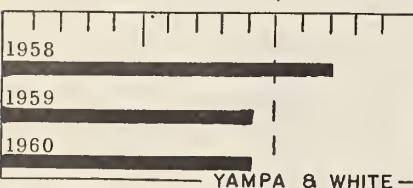
UPPER SOUTH PLATTE: There was an increase in the snowpack in this area, during March. It now looks like there will be sufficient water to meet irrigation needs in this area. High elevation snow is good. Streams are already flowing due to warmer than usual weather. Soil moisture is good.

LOWER SOUTH PLATTE: Some water shortage could be experienced in this area. Of the tributaries flowing into the South Platte, only the Clear Creek and the main stem are above normal. Heavy upstream usage will limit flow to about 80% of usual. Soil moisture, however, is excellent. Heavy winter snows left this soil high in moisture content.

ARKANSAS: This area can look forward to a streamflow similar to last year and near normal. The snowpack is 95% of last year and 101% of normal. Due to the heavy draw down of John Martin Reservoir last year, the area below Canon City will experience some shortages. John Martin Reservoir contains only about one-tenth of what it did last year at this time. The Great Plains group of reservoirs is the only system that is above normal. Excellent soil moisture conditions may help relieve reservoir shortages.



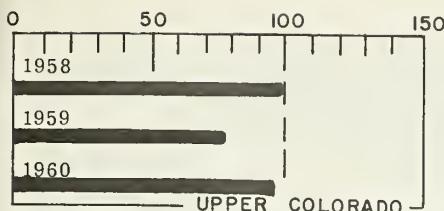
PURGATOIRE-CUCHARAS: About normal is the water supply outlook for this area. The snowpack on LaVeta Pass is about 93% of normal. Soil moisture is reported as good in this area.



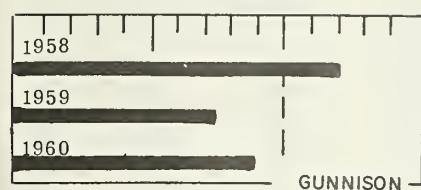
Average

YAMPA-WHITE: Water supply should be nearly adequate. The snowpack is up to 94% on the Yampa. Soil moisture at high elevations is excellent and reported as good in lower areas.

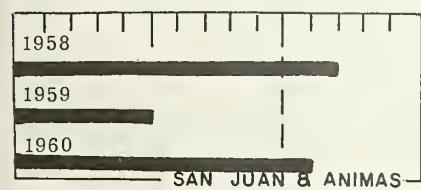
WATER SUPPLY OUTLOOK



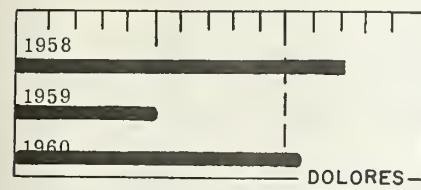
UPPER COLORADO: The main stem of the Colorado has a 99% of normal snowpack. The streamflow should be near normal. Water supply for this area should be generally adequate. Soil moisture is reported as good. High temperatures have started some streams running already.



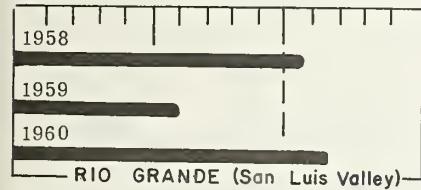
GUNNISON: Water supply for the Gunnison is about 90% of normal. Current water supply outlook has been improved by the late season snows. Storage in Taylor Park Reservoir is below normal. Soil moisture is excellent.



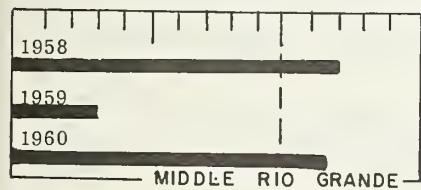
SAN JUAN & ANIMAS: One of the highest snowpacks in the state exists on these watersheds. Both have 110% of normal. This is not as high as was anticipated early in the season, but still high. The low snows have disappeared due to high temperatures and high water is already starting to flow. The water supply in this area is excellent. Soil moisture is good at all elevations.



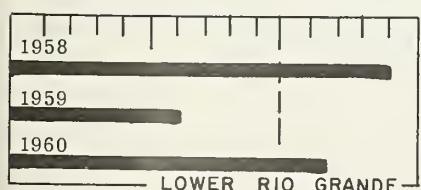
DOLORES: Water supply outlook for this area is excellent. Snowpack is 107% of normal. Low snows are disappearing rapidly. Soil moisture is excellent in this area.



RIO GRANDE (San Luis Valley): Snowpack in this area is 115% of normal. The comparatively low percentage is caused by the scarcity of low snow. Some of this has been melted by unseasonably high temperatures. It is reported many streams are already flowing. Small reservoirs contain about 90% of normal carryover. Soil moisture at all elevations is excellent. An excellent water supply is assured in this area.



MIDDLE RIO GRANDE (New Mexico): Excellent water supply is the prospect for this area. High snowpack both in Colorado and New Mexico virtually guarantees above normal runoff. Some areas in New Mexico have snow packs as high as 175% of normal. Reservoir storage is below normal, but not critical. Most of the areas are reporting excellent soil moisture conditions and none are reporting less than good conditions.



LOWER RIO GRANDE: Lower Rio Grande should have an adequate water supply this year. Elephant Butte Reservoir does not contain as much water as last year at this time but still has a good supply. If the warmer trend continues an early runoff is in prospect. Soil moisture is reported as good in most areas.

FOR DETAILS ON WATER SUPPLY CONDITIONS ON THE COLORADO RIVER DRAINAGE IN UTAH AND ARIZONA, NOT LISTED OR DISCUSSED IN THIS REPORT, REFERENCE SHOULD BE MADE TO THE STATE SNOW REPORTS FOR UTAH (see inside cover).

Average

STREAMFLOW FORECASTS
APRIL-SEPTEMBER INCLUSIVE*

April 1, 1960

"The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature during the forecast period will be near average. Appreciable deviations from normal of temperature and/or precipitation during the forecast period will correspondingly modify these forecasts."

BASIN AND STREAM	Forecast 1000 AF	15-Yr. Avg.		BASIN AND STREAM	Forecast 1000 AF	15-Yr. Avg.	
		% Avg. 1943-57	Avg. 1943-57			% Avg. 1943-57	Avg. 1943-57
NORTH PLATTE				COLORADO			
Laramie at Jelm	80	71	113	Gunnison at Gr. Junction	1356	98	1386
SOUTH PLATTE				San Juan at Rosa, N.M.	760	129	587
Cache la Poudre at Canon(1)	195	103	189	Piedra at Piedra	185	99	186
Big Thompson at Drake	80	86	93	Los Pinos nr Bayfield (7)	270	123	220
Saint Vrain at Lyons	75	89	84	Florida nr Durango	74	120	62
Boulder at Orodell	52	95	55	Animas at Durango	570	120	475
Clear Creek at Golden (2)	151	110	137	La Plata at Hesperus	32	114	28
ARKANSAS				Dolores at Dolores	335	120	279
Arkansas at Salida (3)	350	103	339	GREEN RIVER			
Arkansas at Pueblo (3)	360	105	342	Little Snake at Lily	350	100	305
Cucharas at La Veta	13	93	14	Elk at Clark	188	87	215
Purgatoire at Trinidad	55	106	52	Yampa at Steamboat Spgs.	270	95	283
COLORADO				White at Meeker	325	97	335
Colorado nr Granby (4)	250	106	235	RIO GRANDE			
Willow nr Granby	43	98	44	South Fork at South Fork	165	136	121
Blue abv Green Mt. Res.	290	100	290	Rio Grande at Del Norte (8)	680	138	491
Colorado at Glenwood Spgs.(5)	1650	107	1546	Alamosa above Terrace Res.	96	135	71
Roaring Fork at Glenwood (6)	850	106	803	Conejos at Mogote	250	127	197
Plateau Creek at Collbran	49	86	57	Culebra at San Luis (9)	30	125	24
Uncompahgre at Colona	160	110	145	Rio Chama nr La Puente	275	125	210
Surface Cr. nr Cedaredge	82	105	78	Costilla at Costilla	31	115	27
				Rio Grande at Otowi Bridge(10)	1008	158	633
				Rio Grande at San Marcial (10)	673	155	434
				Pecos at Pecos	70	146	48

- (1) Observed flow minus diversions from Michigan, Colorado and Laramie Rivers, plus diversions for irrigation and municipal use.
- (2) Observed flow minus diversions through Jones Pass Tunnel.
- (3) Observed flow plus change in storage in Clear Creek, Twin Lakes and Sugar Loaf Reservoirs minus diversions through Busk-Ivanhoe and Twin Lake Tunnels and Ewing, Fremont Pass, Wurtz and Columbine Ditches.
- (4) Observed flow plus diversions by Adams tunnel and Grand River ditch plus change in storage in Granby Reservoir.
- (5) Observed flow plus the changes as indicated in (4) plus Moffat Ditch.

- (6) Observed flow plus diversion through Twin Lakes tunnel.
- (7) Observed flow plus changes in Vallecito Reservoir.
- (8) Observed flow plus change in storage in Santa Maria, Rio Grande, and Continental Reservoir.
- (9) Observed flow plus changes in storage in Sanchez Reservoir.
- (10) Observed flow plus changes in storage in Santa Maria, Rio Grande, Continental, Terrace, Sanchez, Platoro and El Vado Reservoirs.

* Rio Grande at Otowi and Rio Grande at San Marcial ave. Mar-July inclusive.

**COOPERATIVE SNOW SURVEYS
SUMMARY OF SNOW MEASUREMENTS**
April 1, 1960

WATERSHEDS	No. of Courses Averaged	Years of Record	Water Content as percent of 1959 Avg.	WATERSHEDS	No. of Courses Averaged	Years of Record	Water Content as percent of 1959 Avg.		
ARKANSAS RIVER									
Arkansas River	10	8-24	95	101	Laramie River	2	10-20	95	84
COLORADO RIVER									
Colorado River*	31	9-24	92	99	South Platte River**	3	11-24	67	89
Roaring Fork	4	2-24	96	87	Poudre River	7	9-24	79	94
Plateau Creek	2	20-23	123	102	Big Thompson River	4	7-22	92	89
Yampa River	6	9-24	--	94	St. Vrain River	3	10-23	59	65
White River	2	23-24	90	94	Boulder Creek	2	7-23	68	85
Gunnison River	10	9-24	114	95	Clear Creek	5	9-24	107	115
Dolores River	4	11-24	175	107	RIO GRANDE				
San Juan River	5	9-24	217	110	Rio Grande (Colo.)	9	9-24	169	115
Animas River	8	9-24	150	110	Rio Grande (N. M.)	12	7-23	234	128
				Conejos River	2	23-24	185	90	
				Chama River	5	10-24	202	103	
				Pecos River	3	10-23	404	176	
				Canadian River	3	18-23	233	95	
				Alamosa River	2	20-23	267	123	

AVAILABLE SOIL MOISTURE

DRAINAGE BASIN AND STATION		SOIL MOISTURE CONTENT IN INCHES Years of Cap. 1960 1959 1958 Avg. Record					DRAINAGE BASIN AND STATION		SOIL MOISTURE CONTENT IN INCHES Years of Cap. 1960 1959 1958 Avg. Record								
Date							Date										
NORTH PLATTE										UPPER COLORADO							
Muddy Pass	3/30	8.0	4.9	0.5	5.0	1.8	6	Vail	3/27	8.0	5.9	--	5.4	6			
Willow Pass	3/25	7.0	5.2	0.6	6.8	2.7	6	Ranch Creek	3/30	7.0	4.3	2.7	4.6	3.0	4		
SOUTH PLATTE										Hairpin	3/30	8.0	3.0	0.1	4.8	1.6	4
Feather	3/24	6.0	2.4	0.1	0.6	0.5	8	Vasquez Siphon	7.0	--	3.9	5.3	4.3	4			
Laramie Road	3/26	7.0	2.3	0.8	2.8	1.7	8	Gore	3/25	7.0	0.7	0.1	1.5	1.1	4		
Beaver Dam	3/25	6.0	3.2	0.3	0.8	0.7	8	Blue River	3/28	7.0	2.4	0.4	4.3	1.7	4		
Two Mile	3/25	8.0	5.6	1.2	3.8	2.4	8	SAN JUAN									
Guard Station	--	7.0	--	0.3	0.8	0.9	8	Mineral Creek	3/30	7.0	5.0	3.1	6.5	4.8	3		
Alpine Camp	3/24	7.0	3.2	0.5	1.2	0.9	8	Molas Lake	3/30	7.0	1.3	0.4	6.4	3.4	3		
Hoop Creek	3/28	6.0	4.7	1.2	1.8	0.9	7	Cascade	3/30	7.0	5.3	5.3	6.4	5.8	3		
Alma	3/28	7.0	5.5	0.2	2.7	1.1	4	GUNNISON									
Kenosha Pass	3/29	7.0	2.5	0.1	4.7	1.9	4	King	3/30	8.0	2.6	5.6	5.3	4.8	3		
Clear Creek	3/28	7.0	2.0	0.6	--	--	2	RIO GRANDE (Colo)									
ARKANSAS										Bristol View	--	7.0	--	--	1.7	7	
Leadville	3/27	7.0	2.7	0.3	1.9	1.0	7	Alberta Park	--	9.0	--	0.5	6.4	2.8	7		
Lake Creek		6.0		2.6	3.7	3.0	4	Mogote	3/28	7.0	4.7	0.3	3.5	1.8	7		
Garfield	3/30	7.0	2.9	2.7	5.3	3.8	4	LaVeta Pass	3/29	8.0	7.4	6.1	4.5	4.4	4		
ROARING FORK										RIO GRANDE (N. M.)							
Placita	3/26	8.0	2.2	0.9	--	5.8	4	Red Summit	3/29	4.8	0.2	0.1	2.5	0.8	6		
Maroon	3/26	8.0	1.8	0.2	2.9	1.8	6	Aqua Piedra	3/29	7.2	1.9	0.9	5.8	3.8	6		
ELK RIVER										Bateman	3/28	6.7	1.0	0.8	6.4	4.5	4
Hahns Peak		--	--	--	--	--	--	Chamita	3/30	8.0	6.2	2.6	7.3	5.8	4		
DOLORES										Fenton Hill	3/31	6.5	6.5	--	--	--	
Lizard Head	3/31	7.0	3.6	2.9	--	--	2	Big Tesuque	3/28	3.7	1.9	3.0	3.7	3.4	3		
Dolores	3/31	7.0	3.2	2.0	--	--	2	Rio En Medio	3/28	3.5	0.3	2.3	--	--	2		
Rico	3/31	7.0	3.3	1.6	--	--	2	Taos Canyon	3/29	3.3	3.1	1.3	3.0	2.2	3		

ALL PROFILE DEPTHS ARE 48 INCHES

STATUS OF RESERVOIR STORAGE
April 1, 1960

RESERVOIR	USABLE CAPACITY 1,000 A.F.	USABLE STORAGE 1000 A.F.			RESERVOIR	USABLE CAPACITY 1,000 A.F.	USABLE STORAGE 1000 A.F.		
		1960	1959	15-yr. Avg. 1943-57			1960	1959	15-yr. Avg. 1943-57
SOUTH PLATTE DRAINAGE									
Windsor	18.6	12.4	12.4	9.8	Twin Lakes	57.9	10.7	12.0	22.7
Cache la Poudre	9.5	8.4	8.6	6.6	Sugar Loaf	17.4	3.1	5.9	8.1
Fossil Creek	11.6	9.1	7.4	7.1	Clear Creek	11.4	8.2	5.3	5.8
Terry Lake	8.2	6.2	5.0	4.4	Meredith	41.9	26.0	25.1	14.5
Halligan	6.4	6.4	5.0	2.0	Horse Creek	26.9	0	2.8	7.3
Chambers Lake	8.8	3.4	2.0	2.1	Adobe Creek	61.6	0	27.8	22.0
Cobb Lake	34.3	18.6	17.8	5.6	Cucharas	40.0	1.2	5.9	4.5
Black Hollow	8.0	3.8	4.0	3.4	John Martin	366.6	20.9	255.9	58.8
Carter	108.9	80.2	81.5	64.8*	Great Plains	150.0	55.4	111.1	50.8
Horsetooth	143.5	110.0	97.1	99.4*	Model	15.0	3.4	5.0	2.5
Lake Loveland	14.3	9.8	10.4	5.7	Conchas (NM)	600.0	328.9	353.0	262.5
Boyd Lake	44.0	3.8	42.2	17.5	W. C. Austin	151.0	140.0	86.6	--
Lone Tree	9.2	7.3	7.8	6.5	ARKANSAS DRAINAGE				
Mariano	5.4	5.1	4.2	2.6	Taylor Park	106.2	49.9	56.7	62.2
Union	12.7	11.6	9.5	6.9	Vallecito	126.3	44.3	47.0	40.7
Eleven Mile	81.9	97.8	97.8	69.2	Groundhog	21.7	3.5	5.8	7.0
Cheeseman	79.0	70.0	59.6	49.2	Granby	465.5	216.4	246.0	197.5
Marston	18.9	16.0	15.2	14.7	Green Mountain	146.9	57.6	49.1	57.7
Antero	33.0	15.7	15.7	14.4	COLORADO DRAINAGE				
Gross	43.1	24.3	18.5	--*	Taylor Park	106.2	49.9	56.7	62.2
Barr Lake	32.2	27.6	24.2	21.3	Vallecito	126.3	44.3	47.0	40.7
Milton	24.4	16.0	16.1	10.8	Groundhog	21.7	3.5	5.8	7.0
Standley	18.5	15.9	10.3	10.9	Granby	465.5	216.4	246.0	197.5
Marshall	10.3	7.3	2.8	2.2	Green Mountain	146.9	57.6	49.1	57.7
Horse Creek	20.6	13.0	13.3	10.8	RIO GRANDE (COLO) DRAINAGE				
Riverside	57.5	56.1	57.5	47.9	Rio Grande	45.8	14.0	7.6	12.6
Empire	37.7	34.1	33.3	29.1	Santa Maria	45.0	4.4	7.8	7.8
Jackson Lake	35.4	33.9	33.9	33.6	Sanchez	103.2	12.5	24.9	9.9
Prewitt	32.8	29.8	28.6	19.8	Terrace	17.7	6.9	2.6	3.0
Point of Rocks	70.0	70.0	70.6	58.2	Continental	26.7	4.5	2.9	7.8
Julesburg	28.2	19.3	21.0	21.4	Platoro	60.0	4.0	34.0	4.6*

*Shorter Periods

VALLEY PRECIPITATION^{1/}

Division Averages and Departures^{3/}

DRAINAGE DIVISIONS	Fall		Winter		DRAINAGE DIVISIONS	Fall		Winter	
	Sept. - Oct.	- Nov.	Dec. - Feb.	Avg.	Dept.	Sept. - Oct.	- Nov.	Dec. - Feb.	Avg.
South Platte River	6.28	+1.90	1.94	+.49	Canadian River, N.M.	6.63	+0.02	2.31	+.40
Arkansas River	7.33	+2.44	2.60	+.56	Rio Grande, Colo.	7.43	+3.70	1.97	+.45
Colorado River	8.16	+2.21	4.72	+.27	Rio Grande, (N.), N.M.	6.81	+0.72	4.56	+1.36
San Juan River, N.M.	7.27	+2.52	3.41	+.70	Rio Grande, (S), N.M.	5.52	+1.32	2.02	+.53
					Pecos River, N.M.	5.21	+0.29	2.36	+.51

^{1/} Preliminary analysis by U.S. Weather Bureau from data furnished by Meteorological Service & U.S. Weather Bureau

^{2/} Departure from average

^{3/} Selected Stations

SNOW COURSE MEASUREMENTS

April 1, 1960

SNOW COURSE	Depth 1960					Water Content In Inches			Years of Record	SNOW COURSE	Depth 1960					Water Content In Inches			Years of Record							
	Date	Inches	1960	1959	Avg.						Date	Inches	1960	1959	Avg.											
**																										
PLATTE RIVER DRAINAGE																										
NO. PLATTE RIVER																										
Cameron Pass	3/28	82	29.2	30.9	24.9	24				Tennessee Pass	3/28	36	11.2	12.5	10.0	24										
Park View	3/25	35	9.8	9.3	9.7	24				Twin Lakes T.	3/29	26	10.2	12.0	10.9	24										
Columbine Lodge	3/30	63	21.5	27.9	24.7	24				La Veta Pass*	3/29	23	7.5	8.1	8.1	24										
Willow Cr. Pass*	2/25	48	14.4	12.4	13.6	22				4 Mile Park	3/28	11	4.5	6.9	4.0	24										
Northgate	2/25	23	7.3	6.7	7.8	10				Fremont Pass	3/27	62	19.6	16.9	16.9	24										
LARAMIE RIVER																										
Roach	3/27	64	18.9	17.1	20.0	20				Monarch Pass	3/29	52	17.7	17.6	18.6	19										
Deadman Hill*	4/5	58	18.5	16.2	16.8	23				Saint Elmo (a)	3/30	40	11.2	9.8	12.0	11										
McIntyre	3/26	29	8.6	12.0	12.5	10				Timberline	4/1	70	19.2	18.4	21.4	11										
POUDRE RIVER																										
Cameron Pass	3/28	82	29.2	30.9	24.9	24				East Fork	3/28	36	11.6	11.8	10.6	8										
Chambers Lake	3/26	27	10.3	14.6	8.8	24				Westcliffe	3/28	14	4.2	7.4	5.5	8										
Big South	3/26	9	2.8	5.0	2.7	24				Bourbon	3/29	24	9.7	6.8	7.8	4										
Deadman Hill	4/5	58	18.5	16.2	16.8	23				Cooper Hill	3/29	60	17.4	--	--	1										
BIG THOMPSON RIVER																										
Lake Irene*	3/25	79	19.9	20.1	22.9	22				COLORADO RIVER DRAINAGE																
Hour Glass Lake	3/28	17	4.8	9.4	9.2	20				COLORADO RIVER (Above Glenwood Springs)																
Red Feather	3/30	13	5.3	9.8	8.8	11				Cameron Pass*	3/28	82	29.2	30.9	24.9	24										
Lost Lake	3/26	36	11.6	16.9	12.2	9				Phantom Valley	3/27	33	11.6	11.3	10.8	24										
ST. VRAIN RIVER											Hoosier Pass*	3/28	49	14.0	17.9	13.1	24									
Wild Basin	3/29	33	9.7	14.9	15.0	23				Berthoud Pass	3/29	52	15.9	17.9	15.0	24										
Copeland Lake	3/29	9	3.6	6.5	6.1	11				Tennessee Pass	3/28	36	11.2	12.5	10.0	24										
Ward	3/29	16	5.4	10.5	7.7	10				M. Fork Camp Gr.	3/29	30	9.4	11.6	9.7	24										
BOULDER CREEK											Fiddler Gulch	3/29	63	19.1	18.2	17.2	23									
University Camp	3/28	68	23.2	29.7	24.5	23				Lulu	3/28	63	18.6	19.1	17.6	22										
Moffat		Abandon								Willow Creek P.	3/25	48	14.4	12.4	13.6	22										
Boulder Falls	3/28	35	11.1	21.1	16.0	7				N. Inlet Grand L.	3/28	29	8.0	10.1	10.3	22										
CLEAR CREEK											Lake Irene	3/28	79	19.9	20.1	22.9	22									
Loveland Pass	3/28	47	16.4	18.7	15.8	24				Arrow	3/28	39	13.1	15.3	11.6	22										
Grizzly Peak*	3/26	66	22.5	17.8	18.9	22				Lapland	3/28	26	8.0	14.4	12.1	22										
Empire	3/30	30	7.9	9.1	7.8	11				Fremont Pass	3/27	62	19.6	16.9	16.9	74										
Berthoud Falls	3/30	42	14.7	16.5	14.5	9				Lynx Pass	3/30	35	10.5	13.9	12.7	24										
Clear Creek	3/28	66	23.3	16.9	16.5	9				Shrine Pass	3/27	61	20.4	17.6	18.3	18										
SOUTH PLATTE RIVER											Grizzly Peak	3/26	66	22.5	17.8	18.9	18									
Hoosier Pass	3/28	49	14.0	17.9	13.1	24				Glen-Mar Ranch	3/29	25	6.1	10.7	8.8	13										
Jefferson Cr.	3/29	30	8.4	12.6	9.8	19				Monarch Lake	3/26	33	9.8	9.9	10.7	12										
Geneva Park	3/28	11	1.9	5.6	4.4	11				Granby	3/25	25	7.2	7.2	8.4	11										
ROARING FORK											Grand Lake	3/27	30	6.8	8.5	9.0	11									
											Berthoud Summit	3/29	72	21.6	25.7	20.4	9									
											Frazer View	3/30	44	12.2	15.6	13.0	9									
											Gore Pass	3/25	29	8.4	11.5	9.8	9									
											Frisco	3/28	20	6.5	8.4	8.7	9									
											Snake River	3/26	25	7.4	10.7	9.0	9									
											Summit Ranch	3/31	21	5.8	8.1	8.7	9									
											Vail Pass	3/27	47	16.2	20.1	19.6	8									
											Pando	3/27	31	11.2	10.6	11.7	8									
											Kokomo	3/26	50	15.6	13.0	12.9	8									
											Milner	3/25	53	15.0	15.3	12.2	8									
											Blue River	3/28	30	8.6	14.1	12.5	3									
											Jones Pass	3/28	56	16.4	17.2	16.8	3									
											Ranch Creek	3/28	34	10.3	11.8	11.2	3									
											Vasquez Creek	3/28	50	15.2	12.5	13.6	3									
											Cooper Hill*	3/29	60	17.4	--	--	1									
											Aspen	3/25	71	19.6	--	--	1									

(* On adjacent drainage)

(** Courses with less than 15 years record in period 1943-57 have all years prior to 1957 averaged.)

NS No Survey

(a) Air observed

SNOW COURSE MEASUREMENTS

April 1, 1960

SNOW COURSE	Date	Depth 1960 Inches	Water Content			Years of Record	SNOW COURSE	Date	Depth 1960 Inches	Water Content			Years of Record	
			1960	In Inches	Avg.					1960	1959	Avg.	Record	
**														
YAMPA RIVER							RIO GRANDE IN COLORADO							
Dry Lake	3/30	51	20.9	21.8	21.0	24	Wolf Creek Pass	3/29	80	32.5	15.3	30.5	24	
Columbine Lodge*	3/30	63	21.5	27.9	24.7	24	Upper Rio Grande	3/26	32	7.7	5.0	7.3	22	
Elk River	3/28	34	14.5	18.6	18.2	24	Santa Maria	3.29	17	3.8	2.1	4.7	21	
Lynx Pass*	3/30	35	10.5	13.9	12.7	24	Pool Table	3/31	29	7.8	4.1	6.1	11	
Rabbit Ears	3/16	121	30.9	NS	28.4	8	L. Humphreys	3/30	18	6.2	4.6	5.8	11	
Yampa View	3/30	41	16.0	NS	16.3	9	Cochetopa Pass	3/28	23	6.5	6.0	4.7	11	
Bear River	3/25	35	9.5	14.0	13.3	4	Red Mt. Pass	3/30	102	36.3	29.3	33.3	9	
Clark	3/29	27	8.9	11.7	13.8	4	Porcupine	4/1	52	14.0	8.1	11.1	8	
WHITE RIVER							Wolf Creek Summit	3/30	104	37.9	15.7	29.8	9	
Burro Mountain	3/30	46	15.9	19.0	18.6	23	Hiway	3/29	91	33.8	13.5	25.9	4	
Rio Blanco	3/29	32	17.4	17.9	16.7	24	Pass Creek	3/29	33	11.6	6.4	11.0	4	
PLATEAU CREEK							ALAMOSA RIVER							
Mesa Lakes	3/26	58	20.5	15.9	17.4	23	Silver Lakes	3/28	18	4.6	3.9	6.1	23	
Trickle Divide	4/1	81	26.8	22.5	28.9	20	Summitville	3/30	88	28.2	8.4	20.5	20	
GUNNISON RIVER							CONEJOS RIVER							
Crested Butte	3/29	36	10.4	11.8	15.3	24	River Springs	3/29	18	5.8	2.7	7.3	23	
Park Cone	3/28	37	10.3	7.1	12.3	23	Cumbres Pass	3/30	51	18.8	10.6	20.2	24	
Alexander Lake	4/1	65	22.0	20.0	22.8	23	Platoro							11
Ironton Park	3/28	42	14.3	14.7	13.1	23	SANGRE DE CRISTO RANGE (COLORADO)							
Trickle Divide	4/1	81	26.8	22.5	28.9	20	LaVeta Pass	3/30	23	7.5	8.1	8.1	24	
Park Reservoir	4/1	70	23.4	20.5	26.8	20	Culebra	4/1	29	9.2	5.5	9.9	20	
Porphyry Creek	3/29	59	20.2	15.4	17.1	20	CHAMA RIVER							
Lake City	3/29	32	9.3	8.1	8.6	11	Cumbres Pass	3/30	51	18.8	10.6	20.2	24	
Cochetopa Pass*	3/28	23	6.5	6.0	4.7	11	Payrole	4/1	24	8.3	5.4	7.9	20	
McClure Pass	4/2	41	15.3	13.4	15.7	10	Chama Divide	3/30	5	1.6	0.0	1.7	20	
Red Mt. Pass	3/30	102	36.3	29.3	33.3	9	Chamita	3/30	26	9.7	3.0	8.7	18	
Blue Mesa	3/28	29	8.7	--	--	2	Bateman	3/28	37	13.3	6.5	11.3	10	
SAN JUAN RIVER							PECOS RIVER							
Wolf Creek Pass*	3/29	80	32.5	15.3	30.5	24	Panchuela	3/30	7	1.9	0.0	1.4	23	
Upper San Juan	3/29	81	33.2	19.0	33.9	24	Big Tesuque	3/28	21	6.9	1.0	4.2	18	
Wolf Creek Summit	3/30	104	37.9	15.7	29.8	9	Rio En Medio*	3/28	37	11.8	4.1	6.1	10	
Chama Divide*	3/30	5	1.6	0.0	1.7	20								
Chamita*	3/30	26	9.7	3.0	8.7	17	RIO GRANDE IN NEW MEXICO							
ANIMAS RIVER							Red River	3/31	20	5.1	3.6	6.9	23	
Silverton Sub. S.	3/30	24	8.8	3.5	5.1	22	Taos Canyon	3/31	13	4.0	2.2	5.1	21	
Ironton Park*	3/28	42	14.3	14.7	13.1	23	Aspen Grove	3/29	18	6.1	2.0	2.7	23	
Cascade	3/30	35	13.0	6.2	12.1	24	Hematite Park*	3/31	9	2.1	1.0	4.4	22	
Spud Mt.	3/30	72	25.8	13.3	24.6	9	Tres Ritos	3/28	16	4.5	2.4	4.2	22	
Molas Lake	3/30	41	14.3	8.4	13.9	9	Payrole	4/1	24	8.3	5.4	7.9	20	
Howardville	3/30	50	14.8	9.2	12.6	9	Cordova	3/25	39	12.3	4.8	11.1	18	
Mineral Creek	3/30	55	18.1	13.0	17.5	9	Big Tesuque	3/28	21	6.9	1.0	4.5	18	
Red Mt. Pass*	3/30	102	36.3	29.3	33.3	9	Elk Cabin	3/30	12	5.0	1.1	1.4	11	
DOLORES RIVER							Rio En Medio	3/28	37	11.8	4.1	6.1	10	
Rico	3/31	20	9.2	0.0	7.7	24	Quemazon	3/30	40	12.8	6.3	6.7	10	
Telluride	3/30	14	4.5	3.8	6.8	24	Fenton Hill	3/30	11	3.3	0.5	2.7	7	
Lizard Head	3/31	56	18.2	13.1	17.6	22	CANADIAN RIVER							
Trout Lake	3/30	48	17.0	11.0	13.5	11	Hematite Park	3/31	9	2.1	1.0	4.4	23	
							Tres Ritos	3/28	16	4.5	2.4	4.2	22	
							Cordova	3/25	39	12.3	4.8	11.1	18	

* On adjacent drainage

** Courses with less than 15 years record in period 1943-57
have all years prior to 1957 averaged.

NS No Survey

(a) Air Observed



Federal - State - Private
COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

*"The Conservation of Water begins
with the Snow Survey"*